

CLAIMS

1. A server terminal configured to operate in a cluster on a network backbone, comprising:
 - a user interface configured to transmit and receive communications during a call with a first terminal connected to the network backbone; and
 - a processor configured to support an inter-cluster call between second and third terminals by establishing a route on the network backbone for each communication packet transmitted from the second terminal to the third terminal.
2. The server terminal of claim 1 wherein the processor is further configured to establish the same route for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call for a first type of call, and to establish a different route for at least two of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call for a second type of call.
3. The server terminal of claim 1 wherein the processor is further configured to establish the route for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call by constructing a network backbone topology map and selecting the established route based on information in the network backbone topology map.
4. The server terminal of claim 3 wherein the processor is further configured to select the established route for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call as a function of the number of intermediary clusters between the second and third terminals along the selected established route for such transmission.
5. The server terminal of claim 4 wherein the processor is further configured to select the established route for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call as a function of the energy of such transmission.

6. The server terminal of claim 1 wherein the processor is further configured to establish the route for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call by mapping the third terminal to a primary route on the network backbone to a first adjacent cluster and a secondary route on the network backbone to a second adjacent cluster, and selecting the primary route or secondary route.
7. The server terminal of claim 6 wherein the processor is further configured to select the primary route during a first type of inter-cluster call, and select either the primary or secondary route during a second type of call, the selection of the primary or secondary route being based on the loading of the network backbone.
8. The server terminal of claim 6 wherein the processor is further configured to establish the route for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call by mapping the first adjacent cluster to a first transmitting gateway and a master terminal for the first transmitting gateway, and mapping the secondary route to a second transmitting gateway and a master terminal for the second transmitting gateway.
9. The server terminal of claim 8 wherein the processor is further configured to establish the route for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call by communicating with the master terminal mapped to the adjacent cluster corresponding to the selected one of the primary and secondary routes to support intra-cluster scheduling and forwarding of such communication packet from the second terminal to the transmitting gateway mapped to such corresponding adjacent cluster.
10. The server terminal of claim 1 wherein the processor is further configured to establish the route for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call using a network address assigned to third terminal, and received from the network backbone in response to a location request.

11. The server terminal of claim 1 further comprising cache, and wherein the processor is further configured to establish the route for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call using a network address assigned to third terminal, and stored in the cache.
12. A method of communications on a server terminal configured to operate in a cluster on a network backbone, comprising:
 - transmitting and receiving communications at the server terminal during a call with a first terminal connected to the network backbone; and
 - supporting an inter-cluster call between second and third terminals by establishing a route on the network backbone for each communication packet transmitted from the second terminal to the third terminal.
13. The method of claim 12 wherein the same route is established for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call.
14. The method of claim 12 wherein a different route is established for at least two of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call.
15. The method of claim 12 wherein the route is established for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call by constructing a network backbone topology map and selecting the established route based on information in the network backbone topology map.
16. The method of claim 15 wherein the established route is selected for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call as a function of the number of intermediary clusters between the second and third terminals along the selected established route for such transmission.
17. The method of claim 16 wherein the established route is selected for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call as a function of the energy of such transmission.

18. The method of claim 12 wherein the route is established for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call by mapping the third terminal to a primary route on the network backbone to a first adjacent cluster and a secondary route on the network backbone to a second adjacent cluster, and selecting the primary route or secondary route.
19. The method of claim 18 wherein the primary route is selected for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call.
20. The method of claim 18 wherein the selection of the primary or secondary route for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call is based on the loading of the network backbone.
21. The method of claim 18 wherein the route is established for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call by mapping the first adjacent cluster to a first transmitting gateway and a master terminal for the first transmitting gateway, and mapping the secondary route to a second transmitting gateway and a master terminal for the second transmitting gateway.
22. The method of claim 18 wherein the route is established for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call by communicating with the master terminal mapped to the adjacent cluster corresponding to the selected one of the primary and secondary routes to support intra-cluster scheduling and forwarding of such communication packet from the second terminal to the transmitting gateway mapped to such corresponding adjacent cluster.
23. The method of claim 12 wherein the route is established for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call using a network address assigned to third terminal, the method further comprising receiving the network address from the network backbone in response to a location request.

24. The method of claim 12 wherein the route is established for each of the communication packets transmitted from the second terminal to the third terminal during the inter-cluster call using a network address assigned to third terminal, the method further comprising retrieving the network address stored in cache at the server terminal.
25. A server terminal configured to operate in a cluster on a network backbone, comprising:
- means for a user to participate in a call with a first terminal connected to the network backbone; and
- means for establishing a route on the network backbone for each communication packet transmitted from a second terminal to a third terminal during an inter-cluster call.
26. A method of communications on a primary server terminal configured to serve a plurality of terminals in a cluster on a network backbone, the method comprising:
- using the primary server terminal to support a plurality of inter-cluster calls for a number of the terminals in the cluster by establishing a route on the network backbone for each of the communication packets transmitted by each of the terminals engaged in one of the inter-cluster calls;
- detecting a server terminal failure;
- designating one of the terminals in the cluster as a backup server terminal; and
- processing a message received from the network backbone at the backup server terminal, the message being addressed to the primary server terminal.